IN THE SPECIFICATION:

At the top of the first page, under the title and just under BACKGROUND OF THE INVENTION, please insert:

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a Divisional of U.S. Application No. 09/777,698, filed January 26, 2001, which is a Divisional of U.S. Application No. 09/050,911, filed March 31, 1998, now U.S. Patent No. 6,186,765, which claims priority from the prior Japanese Patent Application Nos. 9-80868, filed March 31, 1997; 9-80869, filed March 31, 1997; 9-80870, filed March 31, 1997; 9-80871, filed March 17, 1997 and 9-309027, filed November 11, 1997, the entire contents all of which are incorporated herein by reference.

Please amend the paragraph starting on page 1, line 6 as follows:

The present invention relates to a method of manufacturing a molded multilayer article and an apparatus therefor. More specifically, the present invention relates to a method and an apparatus which is capable of efficiently producing molded multilayer articles in a wide variety of sizes and shapes by combining a process of laminating a plurality of ~~a~~ extruded molten polymer layers and a process of compression molding.

Please amend the paragraph starting on page 1, line 21 as follows:

A sheet is formed by extruding a molten polymer through an extrusion die, and successively the sheet is ~~feed~~ fed to molds for a compression molding process. Therefore, the extrusion die and the associated parts must be moved toward the molds. Various devices adapted for moving an extrusion die along a predetermined path over the bottom half mold of an open mold have been disclosed, for example, in JPB No. 17931/1982 and JPA No. 137814/1988.

Please amend the paragraph starting on page 4, line 10 as follows:

According to one aspect of the present invention, a method for manufacturing a molded multilayer article by molding a multilayer sheet consisting of a plurality of polymer layers, ~~said method~~ comprises the steps of: extruding a plurality of monolayers of molten polymers by forcing the molten polymers into a multiple T die combined with a plurality of T dies so that the molten polymers are extruded through the T dies outside the multiple T die

while the polymers are in a molten state or a semi-molten state; feeding the intermediate molten multilayer to a compression mold having the bottom half mold and a top half mold by advancing the multiple T die into a space between the bottom half mold and top half mold.

Please amend the paragraph starting on page 4, line 27 as follows:

According to another aspect of the present invention, an apparatus for manufacturing a molded multilayer article by molding a multilayer sheet, ~~said apparatus~~ comprises: a plastication means for separately plasticating polymers for forming each of monolayers and feeding molten polymers by pressure; a multiple T die combined with a plurality of T dies for extruding the monolayers and jointed to the plastication means; moving means for moving the plastication means and the multiple T die all together; a laminating means provided with the multiple T die to form an intermediate molten multilayer by superposing and laminating the monlayers extruded in molten or semi-molten state; a cutting means provided with the multiple T die for cutting the intermediate molten multilayer in a predetermined length; and a compression molding means provided with a mold for molding the intermediate molten multilayer into a finished multilayer article of a desired shape.

Please amend the paragraph starting on page 7, line 23 as follows:

Figs. 1 to 7 show a molded multilayer article manufacturing apparatus in a first embodiment according to the present invention. The firs embodiment will be described as applied to manufacturing a molded article with three layers. Numeral 10 represents a plastication means for plasticating a polymer material for each of the layers and applying pressure to each molten polymer to force it out. As shown in Fig. 2, an injection molding machine acting as the plastication means 10 is provided with three injection units 10a, 10b and 10c disposed in a parallel arrangement. The injection units 10a, 10b and 10c have delivery nozzles 12a, 12b and 12c, which are connected to T dies 14a, 14b and 14c (a slot die is referred to as the T die 14a, 14b and 14c that shapes the molten polymer into a molten monolayer, respectively.

Please amend the paragraph starting on page 7, line 36 as follows:

As shown in Fig. 9, the T dies 14a, 14b and 14c are provided with deckles for adjusting slot opening to adjust the widths of the molten monolayer extruded through the slot openings of the T dies 14a, 14b and 14c, respectively. The T dies 14a, 14b and 14c are

assembled to construct a multiple T die 14. The polymers are formed into the molten monolayers by the extrusion through the T dies 14a, 14b and 14c of the T die 14 in a molten state or a semi-molten state. The polymer layers of the molten or semi-molten polymer are laminated to form an intermediate molten multilayer 16.

Please amend the paragraph starting on page 8, line 33 as follows:

Referring to Fig. 3, a laminating mechanism 26 is disposed near the slot openings of the multiple T die 14 integrally therewith. The laminating mechanism 26 forms the intermediate molten multilayer 16 by laminating molten monolayers 16A, 16B and 16C extruded through the T dies 14a, 14b and 14c respectively. The laminating mechanism 26 is disposed upstream~~s~~ of a cutting mechanism 20 for cutting the intermediate molten multilayer 16 to a predetermined length with respect to a direction in which the intermediate molten multilayer 16 is delivered. The laminating mechanism 26 is ~~porvided~~ provided with a pair of nip rollers 26a and 26b which sandwiches the mid-monolayer 16C between the outer monolayer 16A and 16B in a manner such that air may not be trapped between each monolayer 16A, 16B and 16C. Cylinder actuators 27a and 27b are connected to operate the nip rollers 26a and 26b. When the nip rollers 26a and 26b move~~s~~ toward each other, the monolayers 16A, 16B and 16C are pressed between the nip rollers 26a and 26b to form them into the laminated intermediate molten multilayer 16.

Please amend the paragraph starting on page 9, line 13 as follows:

The laminating mechanism 26 is capable of dealing with a laminating operation for a predetermined intermittent pattern for forming an intermediate molten multilayer ~~consisted of~~ comprising pieces of the monolayers 16A, 16B and 16C of different lengths. Multilayer articles having such ~~the~~ intermittent patterns and shapes can be manufactured by moving the nip rollers 26a and 26b toward and away from each other according to the pattern.

Please amend the paragraph starting on page 9, line 29 as follows:

Fig. 5 is a typical longitudinal sectional view showing an essential part of the multilayer ~~arttiele~~ article manufacturing apparatus and the arrangement of limit switches for the positioning of the multiple T die 14 and for the sequential control of operations of the

component mechanisms of the apparatus. Fig. 7 is a block diagram for ~~a~~ an automatic sequential control system.

Please amend the paragraph starting on page 9, line 35 as follows:

Referring to Fig. 5, a limit switch LS includes contacts 1 to 4 disposed on the bed 17. A contact operating member 30 for operating the contacts 1 to 4 is attached to the base 19 on which the injection units 10a, 10b and 10c are mounted. The contact operating member 30 closes and opens the contacts 1 to 4 of the limit switch LS according to the position of the multiple T die 14 as the base 19 is moved. The contacts 1 to 4 of the limit switch LS correspond, respectively, to positions LS1 to LS4 on the bottom half mold 24b of the compression molding machine 18. Signals indicating the condition of the contacts 1 to 4 of the limit switch LS ~~is~~ are sent from the base moving mechanism 22 to a sequencer 34. Then the sequencer 34 executes a sequential control program on the basis of the input signals to control the operational sequence of the multilayer article manufacturing apparatus.

Please amend the paragraph starting on page 10, line 12 as follows:

In the first embodiment, when the base 19 moves forward and the contact 1 of the limit switch LS is closed by the contact operating member 30, the slot openings of the multiple T die is located at a position directly above the position LS1 on the bottom half mold 24b. When the multiple T die 14 is moved backward, and the contact 2, 3 or 4 of the limit switch LS is closed, ~~a~~ an end portion of the intermediate molten multilayer cut by the cutting mechanism 20 corresponds to the position LS2, LS3 or LS4. When the multiple T die 14 is at a position shown in Fig. 5, the contact 3 of the limit switch LS is closed. If the intermediate molten multilayer 16 is cut off by the cutting mechanism 20 at the moment when the contact 3 of the limit switch LS is closed, the cutting end lies at the position LS4 on the bottom half mold 24b.

Please amend the paragraph starting on page 11, line 18 as follows:

The multiple T die 14 continues to extrude the monolayer 16A, 16B and 16C, while the injection unit 10a, 10b and 10c together with the base 19 is advanced to move the multiple T die 14 into the space between the open top half mold 24a and the bottom half mold 24b. The monolayers 16A, 16B and 16C are superposed and laminated between the nip

rollers 26a and 26b disposed below the multiple T die 14 to form the ~~intermediate~~ intermediate molten multilayer 16.

Please amend the paragraph starting on page 11, line 32 as follows:

The sequencer 34 gives an instruction to the base moving mechanism 22 to retreat the multiple T die 14. While retreating, the intermediate molten multilayer 16 is extruded continuously through the multiple T die 14 so as to be placed onto the bottom half mold 24b.

Please amend the paragraph starting on page 12, line 8 as follows:

Thus, the laminating process of the monolayers 16A, 16B and 16C extruded through the multiple T die 14 and the delivery of the intermediate molten multilayer 16 to the bottom half mold 24b is accomplished with one motion of the base moving mechanism 22.

Please amend the paragraph starting on page 12, line 22 as follows:

It is preferable to assemble the T dies 14a, 14b and 14c so that the intermediate molten multilayer 16 with the thickest or heaviest monolayer 16B as a ~~most below~~ lower most layer is delivered to the bottom half mold 24b as shown in Fig. 4. When the T dies 14a, 14b and 14c are assembled so as to meet the foregoing requirement, it is preferable to dispose~~d~~ the T die 14b, connected to the injection unit 10b, so that the delivery nozzle 12b is the shortest among the delivery nozzles 12a, 12b and 12c, as shown in Fig. 2, to force the molten polymer into the T die 14b at a low pressure loss and to save space.

Please amend the paragraph starting on page 12, line 36 as follows:

A multilayer ~~arttiele~~ article 40a shown in Fig. 8(a) is a three layer structure consisting of a first monolayer 16A serving as a skin layer, a second monolayer 16B serving as a base layer , and a third monolayer 16C serving as an mid-layer, and the monolayers 16A, 16B and 16C have the same shape and made of the same thermoplastic polymer, such as a polyolefin.

Please amend the paragraph starting on page 13, line 6 as follows:

A multilayer article 40b shown in Fig. 8(b) is a ~~threelayer~~ three layer structure consisting of monolayers 16A, 16B and 16C respectively having different shapes. The

monolayers 16A, 16B and 16C have different shapes in respect of the width pattern, respectively. The adjusting devices 42a, 42b and 42c included in the T dies 14a, 14b and 14c are controlled so as to vary the widths of the monolayers 16A, 16B and 16C according to the patterns as shown in Fig. 8(b) to form the multilayer article 40b ~~have~~ having layers in different width patterns.

Please amend the paragraph starting on page 13, line 15 as follows:

A multilayer article 40c is a two layer~~s~~ structure consisting of monolayers 16A and 16C serving as a surface layer, and a monolayer 16B serving as a base layer. The monolayers 16A and 16C ~~having~~ have a different color or made of a material different from each other.

Please amend the paragraph starting on page 13, line 15 as follows:

A multilayer article 40d shown in Fig. 8(d) ~~has~~ is a three layer~~s~~ structure consisting of a monolayer 16A serving as a skin layer, a monolayer 16B serving as a base layer, and a monolayer 16C serving as a mid-layer. The length of the monolayer 16A is shorter than those of the monolayer 16B and 16C. While laminating the monolayers 16A, 16B and 16C, only the monolayer 16A is cut to a predetermined shorter length by the cutting mechanism 20, and the feed of the molten polymer by the injection unit 10a to the T die 14a through which extrudes the monolayer 16A is suspended. ~~That~~ This process~~es~~ enables to form the multilayer article 40d partly varying in the number of layers easily.

Please amend the paragraph starting on page 13, line 15 as follows:

A multilayer article 40c is a two layer~~s~~ structure consisting of monolayers 16A and 16C serving as a surface layer, and a monolayer 16B serving as a base layer. The monolayers 16A and 16C ~~having~~ have a different color or made of a material different from each other.

Please amend the paragraph starting on page 14, line 1 as follows:

The polymer material used for forming the mid-layer 16C contains a foaming agent. The injection unit 10c plasticates the polymer material at a relatively lower temperature which does not cause the foaming agent to generate a gas, and then feeds the polymer material to the T die 14c. The temperatures of the molten polymer forming the skin

layer 16A and the base layer 16B are higher than that of the molten polymer for the mid-layer 16C by temperatures in the range of 50 to 100 °C

Please amend the paragraph starting on page 17, lines 30-31 as follows:

4. Example of Sequential Control Program for Multilayer ~~Arttiele~~ Article Manufacturing

Please amend the paragraph starting on page 19, line 11 as follows:

The cutting mechanism 100 is disposed downstream of the laminating mechanism 26 with respect to a feed direction. The cutting mechanism 100 is provided with a pair of pad members 110 disposed opposite to, each other to press the intermediate molten multilayer 16 therebetween. An opposite end surface of each pad member 110 has a spherical surface adaptable for introducing the intermediate molten multilayer 16 in contact with it. In this embodiment, each pad member 110 is divided into a pair of half pads 110a and 110b disposed one over the other symmetrically with a narrow space 120 formed therebetween. The pad members 110 each comprising the half pads 110a and 110b are connected to driving devices 112, such as a hydraulic cylinder .

Please amend the paragraph starting on page 19, line 31 as follows:

The pad members 110 are provided with air passages 118, as an air blowing means, open into the spherical surfaces thereof to blow compressed air toward the surface of the intermediate molten multilayer 16 in order to facilitate the removal from the surfaces of the pad members 110. The space 120 is confined between the opposite walls of the half pads 110a and 110b. The spherical surfaces of the half pads 110a and 110b are formed so as to protrude toward the intermediate molten multilayer 16, and the space 120 is located between the walls which intersect the top contact surface of the half pads 110a and 110b. Either of the pad members 110 is provided with a cutting blade 122 disposed in the space 120 between the half pads 110a, and the cutting blade can sticks out from the spherical surface of the half pads toward the intermediate multilayer 16. The cutting blade 122 has a cutting edge 122a and is positioned so that the cutting edge 122a projects slightly from the spherical surfaces of the half pads 110a and 110b. The cutting blade 122 is connected to a cutter running device 124 which moves the cutting blade 122 in the transverse direction of the intermediate molten multilayer 16 to cut it ~~of~~ off to a given length.

Please amend the paragraph starting on page 20, line 30 as follows:

Although the intermediate molten multilayer 16 is in the ~~the~~ molten or semi-molten state as a whole, a small portion thereof in contact with the pad member 110 may be cooled by the cooling effect of the coolant flowing through the passages 116. A shaded part shown in Fig. 16 is the cooled portion of the intermediate molten multilayer 16. The cutting blade 122 is disposed so as to be opposite closely to the cooled portion of the intermediate molten multilayer 16. When the cooled portion of the intermediate molten multilayer 16 is solidified into a state sufficient to cut it off ~~easely~~ easily, the cutter running device 124 commences movement of the cutting blade to move. Consequently, the cutting blade 122, which has been on standby, travels transversely to cut off the intermediate molten multilayer 16 to a predetermined length.

Please amend the paragraph starting on page 21, line 16 as follows:

During the cutting process, the molten intermediate multilayer 16 is cut with the cutting blade 122 while the same ~~are~~ is pressed between the presser pads 110, so that air may not ~~be~~ entered into clearances between the laminated monolayers 16A, 16B and 16C.

Please amend the paragraph starting on page 29, line 10 as follows:

Referring to Fig. 28, cutting members 214a, 214b and 214c are held on a bracket 212 which is attached to ~~an~~ a front end of a swing plate 216. The swing plate 216 is supported for swinging by a support shaft 218 on brackets 220.

Please amend the paragraph starting on page 31, line 29 as follows:

The molded multilayer article manufacturing apparatus may be provided with a guide means including guide rails disposed on a fixed plate~~n~~ mounted with the bottom half mold so as to extend over the bottom half mold to guide the multiple T die, the laminating mechanism and the cutting mechanism for simultaneous movement toward and away from the mold of the compression molding machine. The guide means ensures the stable, reliable movement of the multiple T die toward and away from the mold n1 synchronism with the operation of the injection molding machine. Stable molding operation can be achieved even if the heavy combination of the multiple T die and the laminating mechanism is supported on the delivery nozzles of the injection molding machine in a cantilever fashion.